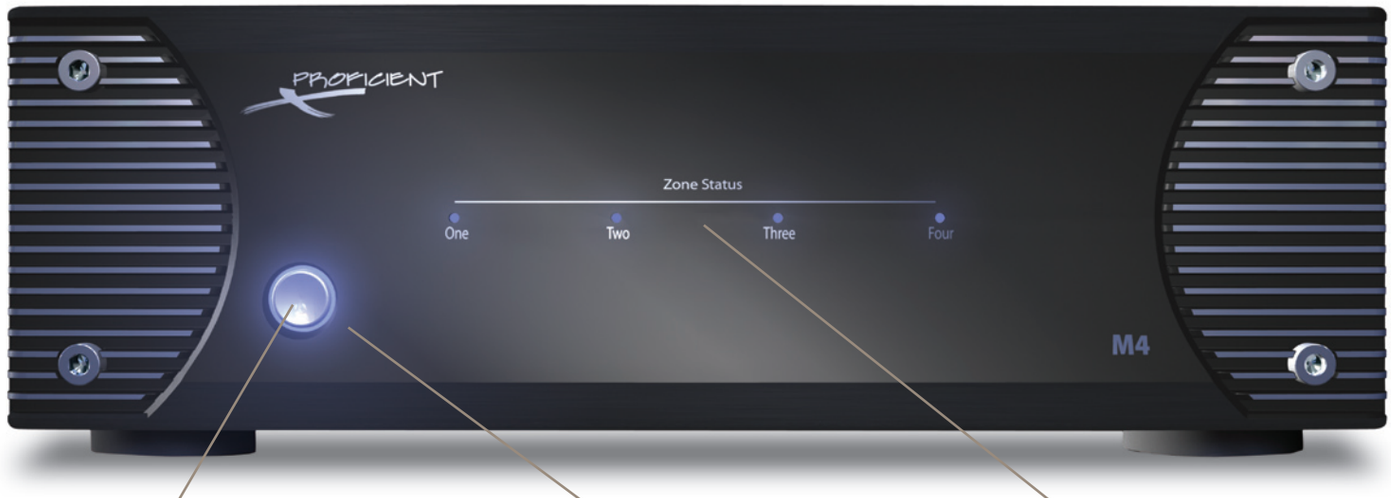
PROFICIENT™
Audio Systems

M4 QUICK START GUIDE

Figure 1
M4 Front Panel Features



MASTER POWER SWITCH

When pressed in, the M4 permits zones to be turned ON and OFF by keypad or touch panel commands.

BLUE INDICATOR LIGHT

Blue indicates the master power switch is ON and one or more zones are active. Red is OFF.

ZONE STATUS LEDS

LED indicators and labels: Four blue LEDs indicate that one or more zones are currently active.

M4 FEATURES

M4 Multi-Zone Audio Amplifier/Controller

The M4 is a four-zone, six-source Audio Amplifier/Controller. It serves as the "brains" of the entire keypad system. The M4 provides audio switching for six sources and 30W/channel audio power amplifiers for four zones. It also has connection termination facilities for the controlled whole house system.

RS-232 DATA I/O
Communication port.

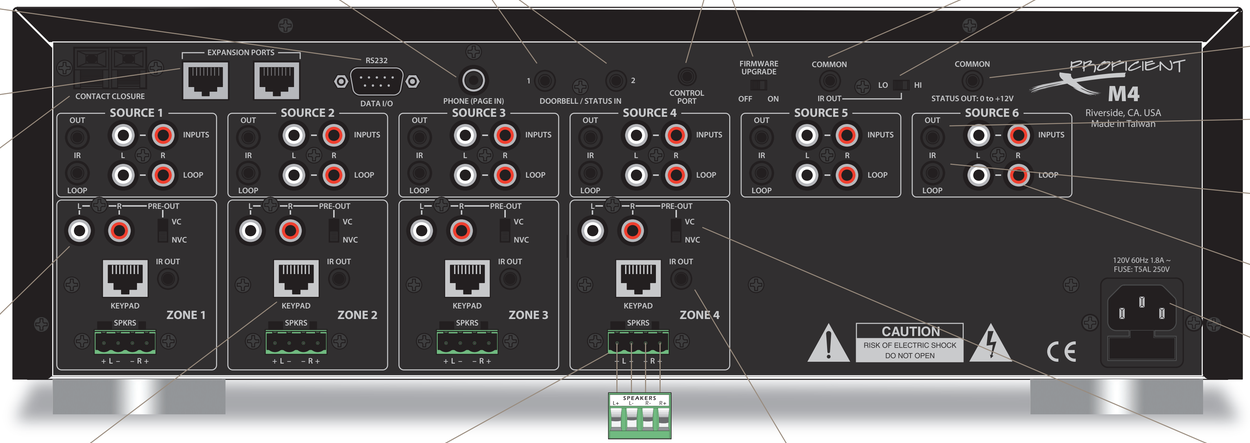
EXPANSION PORTS
RJ45 jacks provide for connection of specialized RS485 controlled products and for looping to additional M4 controllers for zone expansion capability.

CONTACT CLOSURE
Provides a single pole dry relay contact to activate any device that can be controlled or triggered by a switch closure. The closure can be programmed within **Proficient Editor** to be activated by keypad presses, Command Library IR, or within macros for Momentary, Toggle and Open/Close Paired operations. Spring-loaded terminals accept wire sizes from 28 to 14 AWG. Internal relay contacts are rated at 2A/30V AC or DC.

L & R PRE-OUT JACKS
These RCA jacks provide line level audio outputs for driving external power amplifiers for additional rooms within zones, where needed.

PHONE PAGE IN JACK
This jack provides input porting for audio feeds from door mikes or other forms of phone or doorbell paging. The jack is programmable by **Proficient Editor**, to turn on as events, when triggered by the DOORBELL/STATUS IN Jack.

Figure 2
M4 Rear Panel Features



KEYPAD ZONE INPUTS
These RJ45 terminals allow for easy connection of the inter-room wiring from keypads in the various rooms. Normally this is accomplished using CAT5 cable with home-run lengths of up to 1000'.

L & R SPEAKERS TERMINALS
These 4-circuit plugable screw-down terminals accept wire sizes from 14 to 28 AWG. They allow quick connection of the internal amplifiers to stereo pairs of speakers in the various zone rooms.

DOORBELL/STATUS IN 1 & 2 JACKS
These 3.5mm mini phone trigger inputs work in conjunction with the PHONE PAGE IN jack. When triggered, the phone inputs can be turned on as programmed by **Proficient Editor**. If audio paging is not required, these **1 & 2** jacks may also be pogrammed as **STATUS inputs** for power management of source or zone components. They accept input levels of 3V to 30V AC or DC for the trigger ON condition. The voltage level must drop below 1V AC or DC for the OFF condition.

CONTROL PORT & FIRMWARE UPGRADE SWITCH
3.5mm 4-circuit mini phone jack allows several control functions. All keypad programming is accomplished via this port using **Proficient Editor** in conjunction with the mating **Transfer Cable**. It also accommodates factory firmware updates in conjunction with the **FIRMWARE UPGRADE OFF/ON Switch**. Be sure to leave this switch in the **OFF** position at all times, except, as instructed within **Proficient Editor**, when you are doing a firmware update. Such updates ensure that you can always have the latest functionality improvements in the field. Another function of this port is that you can control installed system components with bi-directional data via touch panels or computers using RS232 protocol.

IR OUT
This 3.5mm mini jack, one for each zone, provides dedicated Zone IR output initiated from the respective zone inputs. They may control specific zone components when you want to prevent the control of it from the other zones.

COMMON IR OUTPUT & HI/LO SWITCH
3.5mm mini phone jack provides a common IR output derived from all of the zone IR inputs and from keypad initiated IR commands derived from the internal IR library. High or low IR power output is set by means of the **HI/LO switch**. Set it to the **LO** setting when driving standard low power emitters (i.e, Proficient IR single flasher). Set it to the **HI** position when driving a high power emitter (i.e, a blaster) for teaching IR commands into learning remotes. **Caution:** The **HI** position will damage or destroy low power emitters!

VC-NVC SWITCH
The audio output from the PRE-OUT jacks can either be controlled by the internal volume control of the M4 (**VC** position) or be a fixed line level output in the no volume control (**NVC** position). In either case, the tone control remains available for room "EQ" settings.

COMMON STATUS OUT PORT
This 3.5mm mini phone jack will go high (+12V DC) when any zone is turned ON and will go LOW (under 1V DC) when the last zone is turned OFF. The max. output of this jack is 100 mA at 9.5V DC.

IR OUT JACKS
These 3.5mm mini phone jacks, one for each source, provide dedicated IR output to specific source components. When a source is selected on a keypad, IR function commands are routed directly to that source. This prevents cross-control interference between two or more sources that have identical IR commands.

IR LOOP JACKS
These six 3.5mm mini phone jacks, one for each source, are provided exclusively for zone expansion capability when using two or more M4 controllers. They permit the source IR signals from the added zones to be carried to the source component emitters.

L & R AUDIO IN & LOOP JACKS
These RCA jacks – four for each source – provide audio signal inputs and buffered loop outputs, for each source. The buffered outputs can be used to drive local components or loop the signals to the additional zone inputs of other M4 controllers when using them for source expansion.

IEC TYPE AC
Mains receptacle and fuse mates with included AC power cord. Also houses the rear panel replaceable AC mains fuse (T5AL 250V for 120V, and T2.5AL 250V for 230V/240V)

M4 AUDIO CONTROLLER WITH KEYPAD SYSTEM

The Proficient M4 System consists of four subsystems. First, the **keypads** themselves can be configured in many key icon arrangements and placed in a one, two or three gang set-up to meet virtually any client requirement. They are connected via convenient CAT5 cable with home-run lengths of up to 1000' (305m or longer, if heavier gauge wire is used) to the centrally located M4 Multi-Zone Audio Amplifier/ Controller located near the controlled equipment. The **M4** contains the "brains" of the system, taking key location data from the keypads to trigger the actual controlling IR, RS232 and RS485 commands that are passed to all of the installed system components. Programming is accomplished by the use of **Proficient Editor**, a Proficient developed Windows software system. A fourth item, the optional **Command Interface** (sold separately), is an installer's tool for learning and teaching special IR commands that are not included in the **Proficient Editor** internal library.

KEYPAD GANG CONFIGURATIONS

The M4 System comes with four single gang PMKIR pre-configured keypads, one for each zone as shown for the single gang version in **Figure 3**. The cover plates and the other configurations are optional. Screw-less "Snap-On" type cover plates are also accommodated. Each keypad comes with a set of factory installed "default buttons" plus a good variety of additional buttons. The default buttons can be easily changed to meet the needs of the installation.

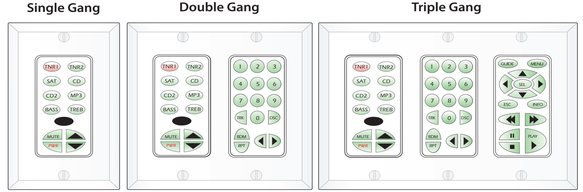


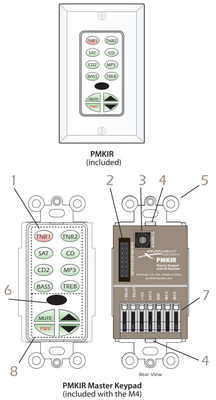
Figure 3
The Keypad Gang Configurations

Keypad Features

The keypads come in four basic modules as shown. The PMK (13 buttons) and PMKIR (12 buttons) are the master keypads and must be used in each system. As mentioned earlier, the M4 comes with a pre-configured version of the PMKIR, for the convenience of the installer. It is usable right "out of the box" in conjunction with a default project that is factory programmed into the M4. The PMKIR includes an IR receiver and has one less function button, but is otherwise identical to the PMK. The PNK Numeric (16 buttons) and PFK Function (14 buttons) keypad modules can be thought of as "slaves" to the master unit (they will not work alone), providing additional key locations for numeric and function commands.

SINGLE GANG

Figure 4



Single Gang Set-Up

1. PMKIR Source/Function Buttons – Six of this set of eight buttons are programmed as source select for the M4. When the system is off, all buttons have a background green color. When a source button is pressed, it turns to a low-level red color to show that it is the active source and the system is on.

2. Keypad Expansion Terminal – This 16-pin header terminal is used to inter-connect the optional numeric and function keypad modules for expansion as needed. A 3-connector ribbon cable is packed with each module for making these connections.

3. Address Switch – A unique hex address must be set for each master keypad when connected on a common bus within a single zone. Unique addresses are not required zone-to-zone. It provides up to 16 addresses (0 to F).

4. Snap Tabs – These tabs hold the decorator style insert panel to the metal mounting plate and are easily released for custom changing of the buttons.

5. Mounting Plate – Standard plate allows the keypad module to be attached to standard in-wall J-Boxes using the two screws provided. Allows attachment of standard decorator type cover plates (also screw-less snap-on plates).

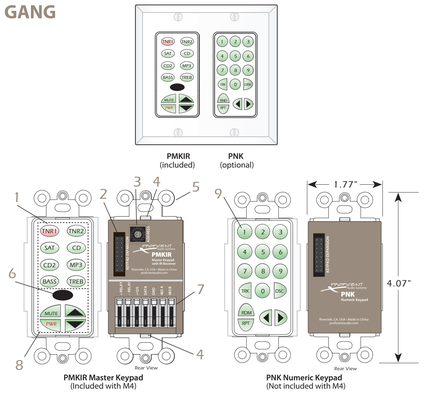
6. IR Receiver Lens – Version PMKIR includes Proficient's exclusive ANS IR receiver, built-in. It allows the use of a handheld remote for control of system components.

7. Connection Terminals – for CAT5 home-run termination. **+ Relay** and **– Relay** - for future use. **+12V** – Powers the keypad, including the internal IR receiver on model PMKIR. Includes reverse voltage protection. **Data** – Sends IR control signals for control of system components. **GND** – Return for power, IR signal and data. **485 A / 485 B** – Balanced, bi-directional system communications data.

8. Function Buttons – These lower four buttons (can be programmed for any function except source select.)

DOUBLE GANG

Figure 5



Double Gang Set-Up

1. PMKIR Source/Function Buttons – Six of this set of eight buttons are programmed as source select for the M4. When the system is off, all buttons have a background green color. When a source button is pressed, it turns to a low-level red color to show that it is the active source and the system is on.

2. Keypad Expansion Terminal – This 16-pin header terminal is used to inter-connect the optional numeric and function keypad modules for expansion as needed. A 3-connector ribbon cable is packed with each module for making these connections.

3. Address Switch – A unique hex address must be set for each master keypad when connected on a common bus within a single zone. Unique addresses are not required zone-to-zone. It provides up to 16 addresses (0 to F).

4. Snap Tabs – These tabs hold the decorator style insert panel to the metal mounting plate and are easily released for custom changing of the buttons.

5. Mounting Plate – Standard plate allows the keypad module to be attached to standard in-wall J-Boxes using the two screws provided. Allows attachment of standard decorator type cover plates (also screw-less snap-on plates).

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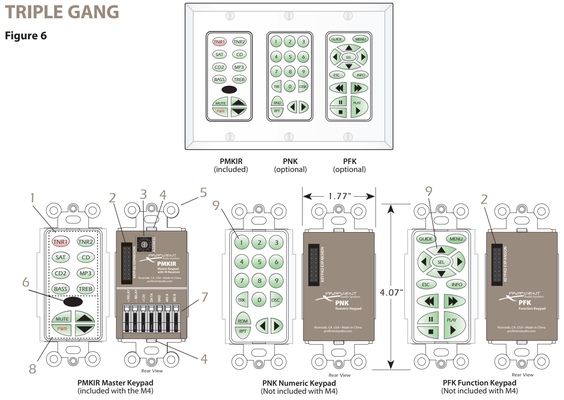
8. Function Buttons – These lower four buttons (can be programmed for any function except source select.

9. Numeric and Function Buttons – Require programming via **Proficient Editor**. All buttons glow background green and can be configured to go off after a set time, or stay on via **Proficient Editor**.

TRIPLE GANG

Figure 6



Triple Gang Set-Up

1. PMKIR Source/Function Buttons – Six of this set of eight buttons are programmed as source select for the M4. When the system is off, all buttons have a background green color. When a source button is pressed, it turns to a low-level red color to show that it is the active source and the system is on.

2. Keypad Expansion Terminal – This 16-pin header terminal is used to inter-connect the optional numeric and function keypad modules for expansion as needed. A 3-connector ribbon cable is packed with each module for making these connections.

3. Address Switch – A unique hex address must be set for each master keypad when connected on a common bus within a single zone. Unique addresses are not required zone-to-zone. It provides up to 16 addresses (0 to F).

4. Snap Tabs – These tabs hold the decorator style insert panel to the metal mounting plate and are easily released for custom changing of the buttons.

5. Mounting Plate – Standard plate allows the keypad module to be attached to standard in-wall J-Boxes using the two screws provided. Allows attachment of standard decorator type cover plates (also screwless snap-on plates).

6. IR Receiver Lens – Version PMKIR includes Proficient's exclusive ANS IR receiver, built-in. It allows the use of a handheld remote for control of system components.

7. Connection Terminals – for CAT5 home-run termination. **+Relay** and **– Relay** - for future use. **+12V** – Powers the keypad, including the internal IR receiver on model PMKIR. Includes reverse voltage protection. **Data** – Sends IR control signals for control of system components. **GND** – Return for power, IR signal and data. **485 A / 485 B** – Balanced, bi-directional system communications data.

8. Function Buttons – These lower four buttons (can be programmed for any function except source select.

9. Numeric and Function Buttons – Require programming via **Proficient Editor**. All buttons glow background green and can be configured to go off after a set time, or stay on via **Proficient Editor**.

SYSTEM CONNECTIONS AND CONFIGURATION

Factory Default System

As mentioned earlier, the M4 comes with a set of four pre-configured PMKIR keypads, one for each zone. In addition, the M4 is pre-programmed at the factory with a default project so that the entire system will function "right out of the box." The installer can use this default as a base on which to build customized projects. The default project has the following functionality: (Refer to **Figures 3 & 7**).

1. Six Source keys: TNR1, TNR2, SAT, CD, CD2, MP3

2. Six Function keys: BASS, TREB, MUTE, PWR, VOL UP, VOL DOWN

3. The six Source keys are set as Zone ON keys and are programmed to select the M4 rear panel Audio Source inputs as follows:

TNR1 = Audio Source 1, TNR2 = Audio Source 2, SAT = Audio Source 3, CD = Audio Source 4, CD2 = Audio Source 5, MP3 = Audio Source 6. In addition, a Mute Off command is programmed under each Source key.

4. The six Function keys are programmed as follows:

BASS: 1st press changes Vol UP/Down to Bass Up/ Down. 2nd press = Bass Flat.

TREB: 1st press changes Vol Up/Down to Treble Up/ Down. 2nd press = Treble Flat.

▲ : Volume Up command. Also serves as Bass or Treble Up after first pressing BASS or TREB keys.

▼ : Volume Down command. Also serves as Bass or Treble Down after first pressing BASS or TREB keys.

NOTE: While in the Treble or Bass tone modes, the selected Source button will blink at a medium rate, to indicate the tone setting mode. The tone setting mode is defeated by one press of any button other than the Tone and Volume buttons.

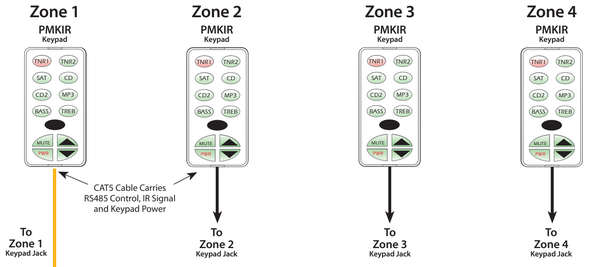
MUTE: Set for Internal Preamp Muting. Toggles ON/OFF. Pressing Source and Volume buttons also un-mutes. During Mute, selected source key blinks slowly.

PWR: Set as Zone Power OFF. Will NOT turn the zone ON. Press and Hold for two seconds turns all zones OFF (Whole House).

Whole House/Party Mode

5. All zones are set for Whole House/Party Mode capability Whole House/Party Mode: Forces all zones to the same source and allows volume and mute functions to operate all zones in unison.

- To engage Whole House/Party Mode, press and hold a desired Source button for longer than two seconds. During press and hold, source button blinks rapidly (busy).



- Release button when blinking stops. Source button then turns Amber in color, indicating system is now in Whole House/Party Mode.

- Source selection, Volume Control and Mute functions will now operate in all zones from the initiating zone only.

- To transfer Whole House/Party Mode control to another zone, above steps are repeated from the desired zone.

- To cancel Whole House/Party Mode, press and hold a Source button from the initiating zone for longer than two seconds (until blinking stops).

NOTE: Zones other than the initiating zone will have red active Source buttons and will operate as normal independent zones.

6. Priority is set to ON for all zones. This means that commands from any keypad in any zone will execute, regardless of previous command executions in other zones.

7. When a zone is first turned on, the volume will be at a default medium background level. After that, it will come on at the last volume used prior to zone turn OFF.

A TYPICAL M4 KEYPAD CONTROLLED SYSTEM

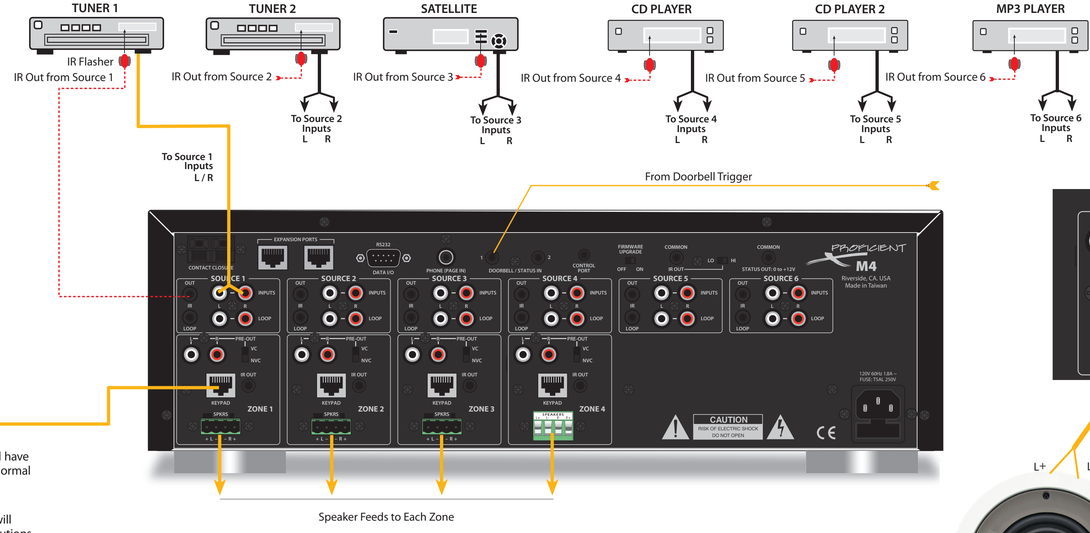


Figure 7

A TYPICAL M4 INSTALLATION

Perhaps the best way to become familiar with the M4/keypad system is to show its application in a typical installation. **Figure 7** shows the four PMKIR keypads (included) controlling the M4 and related source components in a four-zone application

NOTE: The system in **Figure 7** is given to illustrate the basics on how to configure and program a system, not to show all aspects of such an installation. For instance, for simplicity, the speakers in each zone are not shown in **Figure 7**, even though such components would be required for a complete working system.

NOTE: Maximum recommended lead length for the keypads with CAT5 cable is 1000' (305m).

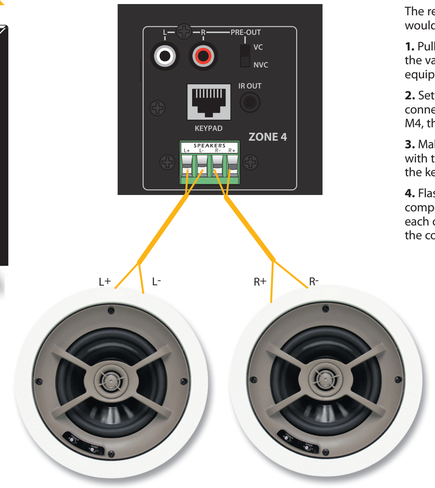
The recommended steps to install such a system would be as follows:

1. Pull all wiring for the keypads, speakers, etc., from the various zone rooms (home runs) to a central equipment area.

2. Set up and make all the necessary audio connections from the source components to the M4, the amplifiers to speakers in rooms, etc.

3. Make sure all system components function first, with their own remote controls, before configuring the keypads.

4. Flasher placement: Locate each source component's IR Sensor window. Place emitters on each of the source components and plug them into the corresponding Source IR Outputs on the M4.



M4 SPECIFICATIONS

Audio Sections

Rated Power/Channel (RMS, 2 channels driven into 8 Ω)	30 Watts, 20Hz - 20kHz
THD (at rated power)	< 0.7%
Power/Channel (RMS, 2 channels driven into 4 Ω)	45 Watts @ 1kHz
Input Sensitivity (For rated power @ max VC)	300 mV
Input Impedance (source inputs)	> 22 kΩ
Input Overload (source inputs)	2.5 V
Output Voltage @ Pre-Outs (w/300 mV @ source inputs)	1.7 V, VC Setting, VC Max 810 mV, NVC Setting
Output Impedance (pre-outs)	< 300 Ω
Frequency Response (@ 1 watt @ 8 Ω)	20Hz - 20kHz ± 1.5dB
Channel Separation	> 50dB @ 10kHz
Crosstalk Between Sources	> 65dB @ 10kHz
S/N Ratio (re: rated output, source inputs shorted)	> 95dB (VC 20dB **IEC A,** below FCW)
Bass Control Range	±10dB @ 100Hz
Treble Control Range	±10dB @ 10kHz

Control Sections

Contact Closures (dry)	2A, 30V AC/DC Max
Phone Page In – Voltage/Impedance	Audio Line Level, > 22 kΩ
Doorbell/Status In 1 & 2, 3V - 30V AC or DC	10 mA @ 12V AC/DC
Common IR Out – HI (high power) – LO (emitter power)	9 V Active High, 82 Ω (110 mA Peak) 9 V Active High, 670 Ω (13 mA Peak)
Zone IR Outs – Voltage/Impedance	9.2 V Active High, 620 Ω (13 mA Peak)
Source IR Outs (and loop) – Voltage/Impedance	11.5 V Active High, 390 Ω (29 mA Peak)
Common Status Out (0-12V DC)	9.5 V @ 100 mA

General

Power Consumption	
No Signal (idle)	50 Watts
At 1/8 Rated Power (3.75 watts/channel)	110 Watts
Line Ratings (120V AC version)	120V AC, 1.8A
Rear Panel Fuse (120V AC version)	T5AL 250V
Line Ratings (230V AC versions)	230V AC, 0.9A
Rear Panel Fuse (230V AC versions)	T2.5AL 250V
Dimensions (H x W x D)	5 13/16" x 17 1/8" x 15 1/2" 148mm x 435mm x 394mm
Weight	20 lbs (9.1 kg)

Limited Two-Year Warranty

Proficient Audio Systems warrants to the original retail purchaser **only** that this product will be free from defects in materials and workmanship for a period of two years, provided the speaker was purchased from a Proficient Audio Systems Authorized Dealer.

Defective products must be shipped, prepaid and insured, together with proof of purchase, to the Proficient Audio Systems Authorized Dealer from whom they were purchased, or to Proficient Audio Systems at the address listed on this installation instruction manual. Freight collect shipments will be refused. It is preferable to ship this product in the original shipping container to lessen the chance of transit damage. In any case, the risk of loss or damage in transit is to be borne by the purchaser.

If, upon examination at the Factory or Proficient Audio Systems Authorized Dealer, it is determined that the unit was defective in materials or workmanship at any time during this warranty period, Proficient Audio Systems or the Proficient Audio Systems Authorized Dealer will, at its option, repair or replace this product at no additional charge, except as set forth below. If this model is no longer available and can not be repaired effectively, Proficient Audio Systems, at its sole option, may replace the unit with a current model of equal or greater value. In some cases where a new model is substituted, a modification to the mounting surface may be required. If mounting surface modification is required, Proficient Audio Systems assumes no responsibility or liability for such modification. All replaced parts and product become the property of Proficient Audio Systems. Products replaced or repaired under this Warranty will be returned to the original retail purchaser, within a reasonable time, freight prepaid.

This Warranty does not include service or parts to repair damage caused by accident, disaster, misuse, abuse, negligence, inadequate packing or shipping procedures, commercial use, voltage inputs in excess of the rated maximum of the unit, or service, repair or modification of the product which has not been authorized or approved by Proficient Audio Systems. This Warranty also excludes normal cosmetic deterioration caused by environmental conditions. This warranty will be void if the Serial Number on the product has been removed, tampered with or defaced.

This Warranty is in lieu of all other expressed warranties. If the product is defective in materials or workmanship as warranted above, the purchaser's sole remedy shall be repair or replacement as provided above. In no event will Proficient Audio Systems be liable for any incidental or consequential damages arising out of the use or inability to use the product, even if Proficient Audio Systems, or a Proficient Audio Systems Authorized Dealer has been advised of the possibility of such damages, or for any claim by any other party. Some states do not allow the exclusion or limitation of consequential damages, so the above limitation and exclusion may not apply.

All implied warranties on the product are limited to the duration of this expressed Warranty. Some states do not allow limitation on the length of an implied warranty. If the original retail purchaser resides in such a state, this limitation does not apply.

CE

PROFICIENT™ Audio Systems

For technical inquiries, please call 877.888.9004 or email us at techsupport@proficientaudio.com. We are available to assist you every weekday, except holidays, between the hours of 7:00 a.m. and 5:00 p.m. PST.

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1301-72400 (rev1)

CONFIGURE THE KEYPAD BUTTONS

1. The keypads have a pre-installed set of buttons in place. These may not match the source and function arrangements you need or desire. To change them, release the tabs on each end of the keypad, **Figure 8**, and remove the decorator insert panel, exposing the key buttons, **Figure 9**.

2. Starting with the Zone 1 PMKIR (master keypad), and using the extra buttons supplied, if needed, move and place the source and function buttons in the arrangement you want. See **Figure 10**. When you finish the arrangement, replace the decorator insert panel over the buttons, being careful to see that the buttons align correctly with the panel openings. Press the panel down until the tabs "snap" into place.

3. Repeat these steps for each of the other zone master keypads. Each zone can have its own unique configuration… but, it is best to keep them as similar as possible to simplify programming and operation.

4. In the same way, configure the buttons on the numeric and function keypads (not included) that you may chose to use in some zones.

5. Connect all keypads to their assigned zones on the M4 as shown in **Figure 7**. Be sure to strip then connect the various colored CAT5 leads to the correct terminals on each keypad end. Refer to **Figure 15**.

Figure 8 Release Tab

Figure 9 Remove Decorator Insert Panel

Figure 10 Moving and Placing Buttons

Figure 11 Ribbon Cable – PMKIR Right

Figure 12 Ribbon Cable – PMKIR Left

Figure 13 RJA-1.1 Adapter

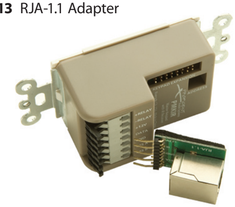


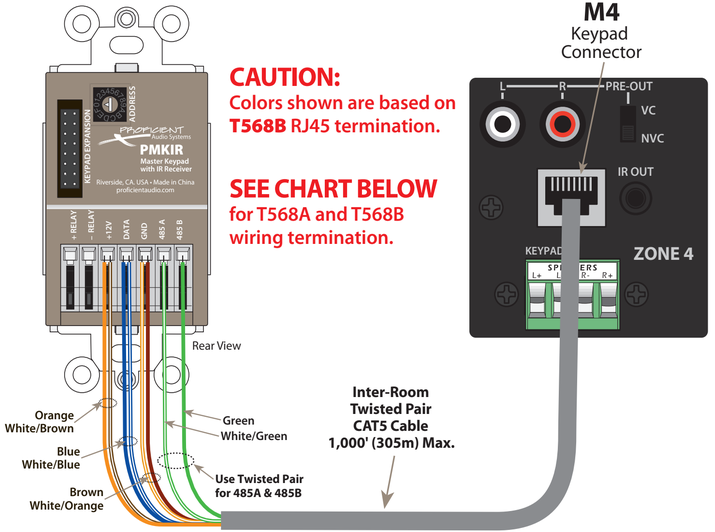
Figure 14 RJA-1.1 Attached to Keypad and CAT5

KEYPAD HOOKUP

NOTE: The numeric and function keypads will not work on their own. They must be connected to a master keypad using the 3-connector ribbon cable supplied (included with each model). The cable is symmetrical so it can be connected with the red striped side up or down, to best fit the configuration. **Figure 11** shows it connected so that the PMKIR master keypad will be to the right of the PNK numeric and PFK function keypads when mounted, whereas **Figure 12** places the PMKIR to the left.

NOTE 1: If you want to use RJ45 connectors for connecting the CAT5 cable to the keypads, you can do so by using the Proficient model RJA-1.1 RJ45-to-Wire Pin Adapters. See **Figure 13** and **Figure 14**. Simply insert the **RJA-1.1** pins into the keypad's connection terminals and snap the levers in place. Be sure to orient them correctly as shown.

Figure 15
Using CAT5 Cable to Connect PMKIR Keypads to M4



Keypad	RJ45	T568B Standard	T568A Standard
12V	Pin 2, 7	Orange, White/Brown	Green, White/Brown
DATA/IR	Pin 4, 5	Blue, White/Blue	Blue, White/Blue
GND	Pin 1, 8	White/Orange, Brown	White/Green, Brown
485A	Pin 3	White/Green	White/Orange
485B	Pin 6	Green	Orange